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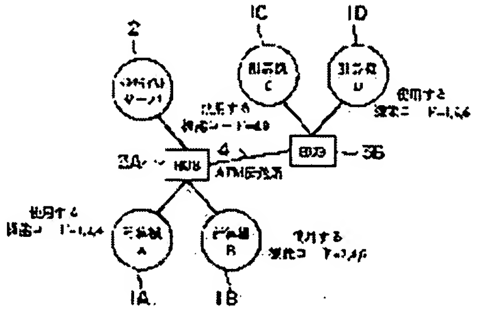
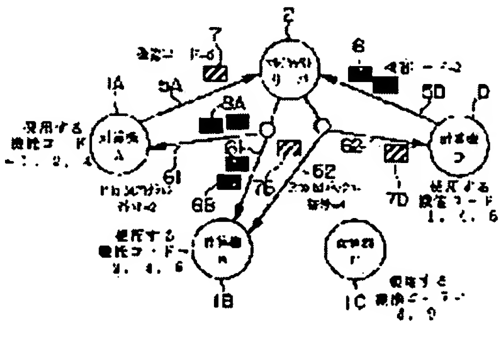
(54) MULTICAST SERVER DEVICE

(57)Abstract:





PROBLEM TO BE SOLVED: To provide a multicast server device in which functional code filtering in the multicast server device and cell re-assembly in the server device can be attained, a delay time due to divided transmission can be shortened, and the device costs can be reduced.

SOLUTION: In a computer control system in which plural hubs 3 with which plural computers 1 are connected are connected through an ATM transmission path 4, a multicast server device 2 connected with the hubs 3 is provided with a means for transferring the computer 1 and the information of functional codes necessitated by the computer, means for re-setting the connection of a point/multipoint at the time of registering the functional codes, and means for selecting multicast connections 61 and 62 to be transmitted from the functional codes in broadest data. When a cell including the functional codes is received, the

selection processing of the multicast connection to be transmitted is started before the end of the re-assembly, and the cell re-assembly and the selection processing of the connection are executed in parallel.

LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

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CLAIMS

[Claim(s)]
[Claim 1] The information transmission system to which two or more terminal units and multicast server equipment were connected through the ATM transmission line is used. It is multicast server equipment it was made to transmit the information to which the data which were sent from the terminal unit, and which came are transmitted to two or more other terminal units all at once, and a terminal unit has them in them to equipment in the end of the other end. The information which matched connection with the terminal unit group corresponding to the classification of data and the classification of multicast server equipment to data to transmit, Multicast server equipment characterized by establishing a means to choose connection with the terminal unit group who should transmit from the classification of the data attached in the data transmitted using this information.
[Claim 2] Multicast server equipment according to claim 1 judged by the function code which prepared the classification of the data which should be transmitted into the data which should be transmitted.
[Claim 3] Multicast server equipment according to claim 1 transmitted to the terminal unit group who should assemble the data which have been sent from the terminal unit, and to transmit again, and should send out as a division cel.
[Claim 4] Multicast server equipment according to claim 3 which carries out precedence initiation of the selection processing of connection with the terminal unit group who should send out without waiting for the completion of reassembling of the data to transmit in the place received to the cel in which the function code in the data to transmit is contained, and is performed in parallel with cel reassembling in selection processing of connection with the terminal unit group who should transmit.
[Claim 5] Multicast server equipment according to claim 4 which carries out precedence initiation of the selection processing of a sending-out multicast connection, without waiting for the completion of reassembling in the place received to the cel in which function code is contained, and performs in parallel 3 ****s of cel reassembling, selection processing of connection with the terminal unit group who should transmit, and division cel transmission.
[Claim 6] Multicast server equipment according to claim 1 to 6 which has a means to exchange the function code information which the terminal unit needs according to the demand by the side of the time of an information-transmission system startup, or a terminal unit.
[Claim 7] Multicast server equipment according to claim 1 to 6 which has a means to add this terminal unit to this terminal unit group when connection with the new terminal unit group who should transmit is set up or established connection exists, whenever there is registration of function code from a terminal unit.
[Claim 8] Claim 1 which added the hub function which are the functions with the main switch of a cel thru/or claim 7 are multicast server equipment of a publication either.
[Claim 9] It is server equipment in the computer controlled system which transmits the information which a self-calculating machine has by connecting two or more calculating machines through an ATM transmission line and a hub, and broadcasting data to other calculating machines. Based on the information which matched the multicast connection from function code and a server to each

calculating-machine group showing data classification Multicast server equipment characterized by filtering the data which had a means to choose the multicast connection who should transmit from the function code in broadcasting data, and had been discarded based on function code by the receiving calculating-machine side within server equipment.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the multicast server equipment which makes possible mitigation of the computer processing load by the garbage data reception in the system for which broadcasting data are used abundantly and information is especially exchanged between computers, and network transmission-line unloading with respect to the computer controlled system which connects a computer in networks, such as ATM-LAN, and controls a plant automatically.
[0002]
[Description of the Prior Art] Although researches and developments have been furthered as a transmission means in a next-generation wide area network, the application to LAN from the descriptions, such as the broadband nature and scalability which a method has, and multimedia orientation, is prosperous in an ATM transmission system. However, since it was necessary to set up beforehand the logical call called VC (Virtual Connection) in order to perform data communication between calculating machines unlike LAN of the conventional medium share mold, in order to have performed broadcasting like LAN of a conventional type, broadcasting server equipment which is used by the LAN emulation was required.
[0003] Broadcasting server equipment sets [the connection of the point-point] up one for the broadcasting connection of N book and the point-multipoint between the calculating machines of N base which has participated in the system, and sets up the connection of a sum total (N+1) book. The calculating machine which wants to perform broadcasting divides a data packet into a cel first, and transmits it to a server. In a server, a cel is returned to a packet, and it transmits to each calculating machine using the broadcasting connection of the point-multipoint so that the cel from two or more calculating machines may not become a nest. By referring to the received header of the high order of a broadcasting packet, although the broadcasting packet from two or more calculating machines is received through one point-multipoint connection, each calculating machine becomes possible [distinguishing a transmitting agency calculating machine], judges whether it is required data, takes in required data, and discards unnecessary data.
[0004] The outline of the system using the above-mentioned conventional broadcasting server equipment is explained using drawing 11 - drawing 13 . One typical example of a configuration of the computer controlled system which used the ATM network for drawing 11 is shown. The network system shown in drawing 11 consists of two or more calculating-machine 1A - calculating-machine 1D, server 2', and two or more hubs (HUB) 3A and 3B. The configuration to which calculating-machine 1A, calculating-machine 1B, and server 2' are connected to hub 3A, calculating-machine 1C and calculating-machine 1D are connected to another hub 3B, and between hub 3A and hub 3B is connected further in the ATM transmission line 4 realizes.
[0005] Drawing 12 is drawing showing signs that the broadcasting data from each calculating machine in drawing 11 are delivered by the conventional server. broadcasting -- a server -- two -- ' -- a calculating machine -- one -- A -- a calculating machine -- one -- B -- a calculating machine -- one -- C -

- a calculating machine -- one -- D -- between -- **** -- broadcasting -- data -- a server -- two -- ' -- turning -- transmitting -- a sake -- the point - the point -- a connection -- five -- A -- five -- B -- five -- C -- five -- D -- and -- a server -- two -- ' -- from -- each -- a calculating machine -- turning -- broadcasting -- transmission -- carrying out -- a sake -- the point - the multipoint -- a connection -- six -- setting up -- having -- .

[0006] The case where calculating-machine 1A and calculating-machine 1D transmit data is explained using drawing 12 . Calculating-machine 1A transmits a data cell 7 towards broadcasting server 2' using connection 5A. Calculating-machine 1D transmits a data cell 8 towards broadcasting server 2' using connection 5D similarly. After server 2' which received the cel from both calculating machines turns the data cells 7A, 7B, 7C, and 7D from calculating-machine 1A to each calculating machine and broadcasts them on a connection 6 so that a cel may be reassembled and the data from calculating-machine 1A and calculating-machine 1D may not become a nest, it turns the data cells 8A, 8B, 8C, and 8D from calculating-machine 1D to each calculating machine, and broadcasts them on a connection 6.

[0007] The server at the time of using the conventional broadcasting server and processing of a computer are explained using the flow chart of drawing 13 . In drawing 13 , if the point multipoint connection with the total-session machine 1 is created (S91) and the broadcasting demand cel from a calculating machine 1 is received first, after starting the assembly (S92) of a broadcasting packet and finishing assembling, broadcasting server 2' is broadcast to all nodes in order so that the data for every calculating machine may not become a nest (S93). The computer 1 which received the cel of broadcasting data assembles a cel (S94), and if it is not the function code which the function code in the assembled packet is taken out (S95), judges whether it is the function code used by the self-computer (S96), will kick AP by the data if it is the function code used by the self-computer (S97), and is used by the self-computer, it will discard data (S98).

[0008] In a computer controlled system, although broadcasting is used abundantly, the broadcast data are not used in all computers. Suppose that there were "1", "2", "4", "6"" 9"5 kinds of function codes used by the system now. The function code for which two kinds, "4" and "9", and computer 1D use the function code for which three kinds, "2", "4", and "6", and computer 1C use the function code for which three kinds, "1", "2" and "4", and computer 1B use the function code which computer 1A uses is the condition of three kinds, "1", "4", and "6",.

[0009] In the above-mentioned conventional technique, since the network connection of the information machines and equipment in office was assumed, when using with the computer controlled system which uses broadcasting data abundantly, the following technical problem occurred. That is, in the computer controlled system field, the technique of notifying the plant data which go up from a controller to all control computers by broadcasting is common. In this kind of system, each computer to receive Since the data which were not concerned with whether the data is needed but were broadcast will be received Since it turns out whether to be required data for the first time with reference to the received function code of data Although data reception loads, such as reception of a calculating machine and reference of function code, were heavy and were originally networks which are not medium share molds, they had the problem that the load of the ATM network transmission line which should use only a transmission route required to deliver data also became heavy.

[0010]

[Problem(s) to be Solved by the Invention] the above-mentioned trouble -- taking an example -- the 1st purpose of this invention -- the broadcasting data reception load of a calculating machine -- ** -- and it is in offering multicast server equipment equipped with the function code filtering function in which ****** can do the load of an ATM network transmission line even as for **. Moreover, the 2nd purpose of this invention is to offer the multicast server equipment which can shorten delay by cel reassembling in server equipment, and division transmission. Furthermore, the 3rd purpose of this invention has a switch transfer of a cel in uniting with the hub which are the main functions and offering the hub one apparatus multicast server equipment made intelligent.

[0011]

[Means for Solving the Problem] The multicast server equipment which applies to this invention in order to attain the above-mentioned purpose establishes a means choose the multicast connection who should transmit from the function code in broadcasting data based on two or more terminal units which consist of a computer, a means exchange the information on the function code which the computer needs, a means reset the multicast connection of the point-multipoint whenever there is registration of function code, and the information that matched function code and a multicast connection. Moreover, precedence initiation of the selection processing of a sending-out multicast connection is carried out without waiting for the completion of reassembling in the place received to the cel in which function code is contained, and selection processing of cel reassembling and a multicast connection is performed in parallel. Moreover, when the switch of a cel adds and made a multicast server function intelligent to the hub which are the main functions, it considered as the configuration without the need of forming server equipment independently with a hub.

[0012]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained to a detail.

(The 1st example) Drawing 1 is a network-system block diagram for explaining the function code in the configuration and this system of the information transfer system (computer controlled system) concerning this invention. The network system using this invention or the multicast server equipment to cut consists of two or more terminal unit (calculating machine) 1A - terminal unit (calculating machine) 1D, multicast server equipment 2, and two or more hubs 3A and 3B. Hereafter, in this specification, it explains taking the case of a computer as a terminal unit. A calculating machine 1 has the function which sends out the functional classification which the self other than the function as a usual terminal unit uses to multicast server equipment, and is registered into this equipment.

[0013] The multicast server equipment 2 concerning this invention forms a multicast connection only in the calculating machine which needs the data which perform and transmit filtering of function code within server equipment, and has the function which does not deliver broadcasting data to the calculating machine which does not need data. Furthermore, multicast server equipment 2 has the function to match with a computer group the functional classification sent from the computer, and to register it, the function to set up the multicast connection of the point-multipoint based on functional classification, and the function that chooses a multicast connection based on the function code contained in the data to transmit.

[0014] Said hub 3 has the function which switches the cel transmitted from a calculating machine, multicast server equipment, or other hubs to the predetermined destination.

[0015] In this invention, function code means what coded the classification of the data needed when each calculating machine performs processing. Computer 1A whose function codes to be used are "1", "2", and "4" in this example, and the code to be used Calculating-machine 1B and the server 2 which are "2", "4", and "6" to hub 3A Computer 1D computer 1C whose function codes to be used are "4" and "9", and whose function code to be used are "1", "4", and "6" is realized by the configuration to which it connects with another hub 3B, and between hub 3A and hub 3B is connected further in the ATM transmission line 4.

[0016] Hereafter, work of the multicast server equipment 2 concerning this invention is explained concretely. The structure by which the broadcasting data from each calculating machine are delivered by the multicast server by this invention by drawing 2 is shown. The case where calculating-machine 1A and calculating-machine 1D carry out broadcasting transmission of the data is explained. Calculating-machine 1A transmits the data cell 7 which has function code"6" towards the multicast server 2 using point-point connection 5A to a server. Similarly, calculating-machine 1D transmits the data cell 8 which has function code"2" towards the multicast server 2 using point-point connection 5D. the function code which the multicast server 2 which received the cel from both calculating machines carries out the reassembly of each cel, and is contained in a data cell 7 -- being based -- function code -- the point-multipoint connection 62 for calculating-machine 1B which has "6", and calculating-machine 1D (number = 2) -- choosing -- the function code from calculating-machine 1A -- the data cells 7B and 7D which have "6" are transmitted. next, the function code contained in a data cell 8 -- being based --

function code -- calculating-machine 1A which has "2", and the point-multipoint connection (number = 4) 61 who calculating-machine 1B turns -- choosing -- the function code from calculating-machine 1D -- the data cells 8A and 8B which have "2" are transmitted. By this, each calculating machine will receive only the data which self needs, and can mitigate the burden of reception sharply.

[0017] The configuration of the communication link protocol layer used for drawing 3 with the network system which consists of the multicast server equipment 2, the hubs 3, and computers 1 concerning this invention is shown. A computer 1 has AP96 with the ATM-PHY layer 91 for carrying out an interface to the ATM transmission line 4, the ATM layer 92, the AAL layer 93 that performs division/reassembling of a cel, and the client function 95 of a multicast. A server 2 has the multicast server function 94 with the ATM-PHY layer 91 for carrying out an interface to the ATM transmission line 4, the ATM layer 92, and AAL93 that performs division/reassembling of a cel. A hub 3 has the ATM-PHY layer 91 and the ATM layer 92 for carrying out an interface to the ATM transmission line 4, respectively.

[0018] The structure of the multicast data table 10 which becomes drawing 4 from the contrast information on function code and a point-multipoint connection number which multicast server equipment 2 holds is shown. The multicast data table 10 matches function code 11, the calculating-machine group 12 which uses the function code concerned, and the point-multicast connection number 13, and is constituted. The calculating machine which uses the data of function code"1" in this example is 101 in which the connection number for function code and a multicast corresponds, and a point-multipoint connection's number which is two sets, a calculating machine A and a calculating machine D, and was set up toward two calculating machines from multicast server equipment is stored like "1." About function code "2", similarly Two sets and connection number "2" (102) of Computer A and Computer B, function code -- "4 "four-set and connection number" 3" (103) -- [of Computer A, the computer B computer C, and Computer D] function code -- "6" -- two sets and connection number of Computer B and Computer D -- "4 "(104) function code" 9 "one-set and connection number" 5" (105) corresponds, respectively, and it is stored. [of Computer C] If there is newly a setting demand of function code, when function code is already registered from the computer, additional registration of the name of the computer group concerned is carried out at the column of the computer group corresponding to the function code. When function code is not yet registered, while newly registering the name of the function code and calculating-machine group concerned, a point-multipoint connection is newly set up, and the number is doubled and registered.

[0019] The flow chart showing the server at the time of using the multicast server by this invention for drawing 5 and processing of a calculating machine is shown. As shown in drawing 1 , when the multicast server equipment 2 concerning this invention is used, function code for which self uses the calculating machine 1 which joins a system towards the multicast server which takes for this invention first is registered (S1). The multicast server 2 will create the table 10 and the point-multipoint connection for every function code who showed drawing 4 , if the function code data from a calculating machine are received (S2). If the broadcasting demand cel from a calculating machine 1 is received after creating the above-mentioned multicast data table 10, the multicast server 2 starts the assembly (S3) of a cel, chooses the multicast connection who takes out the function code contained after cel assembly termination and in a packet, and sends out with reference to said table 10 (S4), and sends out a cel to an applicable connection (S5). The calculating machine which received the cel of broadcasting data kicks AP for a cel by the assembly (S6) and its data (S7).

[0020] Hereafter, order is explained for the division into a cel later on. Drawing 6 is drawing in which being ATM level and having shown how a cel would divide / reassemble data from AP level of the communication link protocol layer configuration shown in drawing 3 . In AP95, function code 951 is given to the data 952 of AP level, and it becomes the broadcasting data 950. This is called the CS-PDU payload 931 by the AAL layer 93. In the AAL layer 93, PAD932 and the CS trailer 933 are given to the CS-PDU payload 931, and it is set to CS-PDU930. CS-PDU930 is divided into two or more SAR-PDU payloads 935. In an ATM layer, the cel header 921 is given to the cel payload 921 which consists of a SAR-PDU payload 935, and it becomes the ATM cel 920. Reassembling is made by processing of the reverse order of this division.

[0021] A timing diagram shows the processing S3 shown in drawing 7 at drawing 5 R> 5 of multicast server equipment 2, S4, and the processing flow of S5. In drawing 7 , multicast server equipment 2 extracts function code from the received cel in the place which reception and reassembling (S3) of the cels 71, 72, 73, and 74 of broadcasting data completed, and chooses the multicast connection who should send out with reference to the multicast data table 10 (S4). After the multicast connection who should send out determines, data are again divided into a cel and it transmits from the multicast connection concerned (S5). In this example, the time delay Td to illustrate arises in the multicast server 2.

[0022] In a system which broadcasts data towards all system subscribers, without limiting a phase hand, looks at the function code in broadcasting data by the receiving-side calculating machine, and judges an important point/needlessness according to this example as mentioned above, since an important point/needlessness is judged with server equipment, and it is controllable not to addressing[to a calculating machine]-transmit if unnecessary, the broadcasting processing load of a receiving-side calculating machine can be mitigated, and the load of an ATM network transmission line can be mitigated further. Moreover, since it becomes possible to determine the address for delivery of data by the central server, it also becomes possible for a system administrator to establish a gateway according to the class of data, and to control delivery of data.

[0023] (The 2nd example) Next, the configuration for making the multicast server equipment 2 concerning this invention high-performance-ize is explained. A timing diagram shows said processing S3, S4, and the processing flow of S5 about how to shorten the time delay Td in the multicast server 2 to drawing 8 . The method shown in drawing 8 processes sending-out connection selection (S4) in parallel with cel reception and a reassembly (S3), and the extract of function code to the method shown in drawing 7 R> 7 paying attention to the point of becoming possible to extract function code for the cels 71, 72, 73, and 74 of broadcasting data by T1 one piece thru/or the time of two pieces receiving. Furthermore, transmission of a cel is started shortly after a sending-out connection's selection (S4) is completed (S5). Thereby, the time delay Td in multicast server equipment can be shortened. According to this example, broadcasting data can once be stored in server equipment, and the time delay to data arrival which poses a problem from there in this kind distributed to each calculating machine of system can be shortened.

[0024] (The 3rd example) Other configurations of the system using the multicast server equipment applied to this invention at drawing 9 were shown. The multicast server equipment 2 shown in drawing 1 and hub 3A are unified, and it instrumentates as an intelligent hub with a multicast server function, or a hub one apparatus multicast server 23. The data transfer between the multicast server 2 and hub 3A is omissible with this.

[0025] The layer configuration of the above-mentioned hub one apparatus multicast server equipment 23 and a computer 1 is shown in drawing 10 . In addition to the ATM-PHY layer 91 which the usual hub has, and the ATM layer 92, hub one apparatus multicast server equipment 23 is equipped with the AAL layer 93 and the multicast server function 94. By constituting as mentioned above, there is a merit which can reduce equipment cost compared with the usual ATM-hub 3 and the configuration which has multicast server equipment 2 independently. Furthermore, the data transfer between the multicast server 2 and hub 3A is omissible.

[0026]

[Effect of the Invention] having a function code filtering function according to the multicast server equipment concerning this invention, as explained above -- the broadcasting data reception load of a calculating machine -- ** -- and even as for **, ****** can do the load of an ATM network transmission line. Moreover, in this multicast server equipment, delay by cel reassembling in server equipment and division transmission can be reduced, and high performance-ization can be attained. Furthermore, it can unite with the hub whose switch transfers of a cel are the main functions, and reduction of system unit cost can be aimed at by making it intelligent.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] Drawing explaining the function code in a computer controlled system.
[Drawing 2] Drawing showing the structure by which the broadcasting data from each calculating machine are delivered by the multicast server by this invention.
[Drawing 3] The multicast server equipment concerning this invention, a hub, the communication link protocol layer block diagram of a computer.
[Drawing 4] Contrast information on function code and a point multipoint connection number which multicast server equipment holds.
[Drawing 5] The flow chart showing the server at the time of using the multicast server equipment concerning this invention, and processing of a calculating machine.
[Drawing 6] Drawing having shown the cellular splititting/reassembling of data.
[Drawing 7] The timing diagram of processing of multicast server equipment.
[Drawing 8] The timing diagram of processing of the high-performance-ized multicast server equipment.
[Drawing 9] Drawing having shown other configurations of the multicast server equipment concerning this invention.
[Drawing 10] The layer block diagram of HUB one apparatus multicast server equipment.
[Drawing 11] The example of the computing-control structure of a system using the conventional ATM network.
[Drawing 12] Drawing showing the conventional broadcasting data delivery.
[Drawing 13] The flow chart showing the server at the time of using the conventional broadcasting server, and processing of a calculating machine.
[Description of Notations]
1 Computer
2 Multicast Server Equipment
2' Broadcasting server
23 Hub One Apparatus Multicast Server Equipment
3 Hub (HUB)
4 ATM Transmission Line
5 Point-Point Connection
6 Point-Multipoint Connection from Server to Each Calculating Machine
61 Calculating Machine A, Multicast Connection for B
62 Calculating Machine B, Multicast Connection for D
7 Broadcasting Cel from Calculating Machine A
8 Broadcasting Cel from Calculating Machine D
91 ATM-PHY Layer
92 ATM Layer
93 AAL Layer

94 Multicast Server Function
95 Multicast Client Function
96 AP
951 Function Code
952 Data
953 Broadcasting Data
931 CS-PDU Payload
932 PAD
933 CS Trailer
930 CS-PDU
935 SAR-PDU Payload
921 Cel Header
920 ATM Cel

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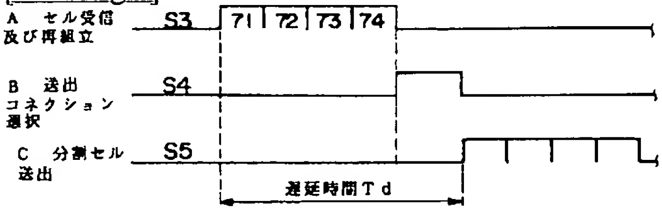
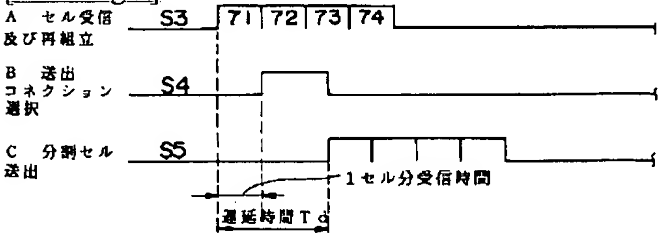
DRAWINGS

[Drawing 7]


A セル受信及び再組立
S3
71
72
73
74
B 送出コネクション選択
S4
C 分割セル送出
S5
遅延時間Ｔｄ

[Drawing 8]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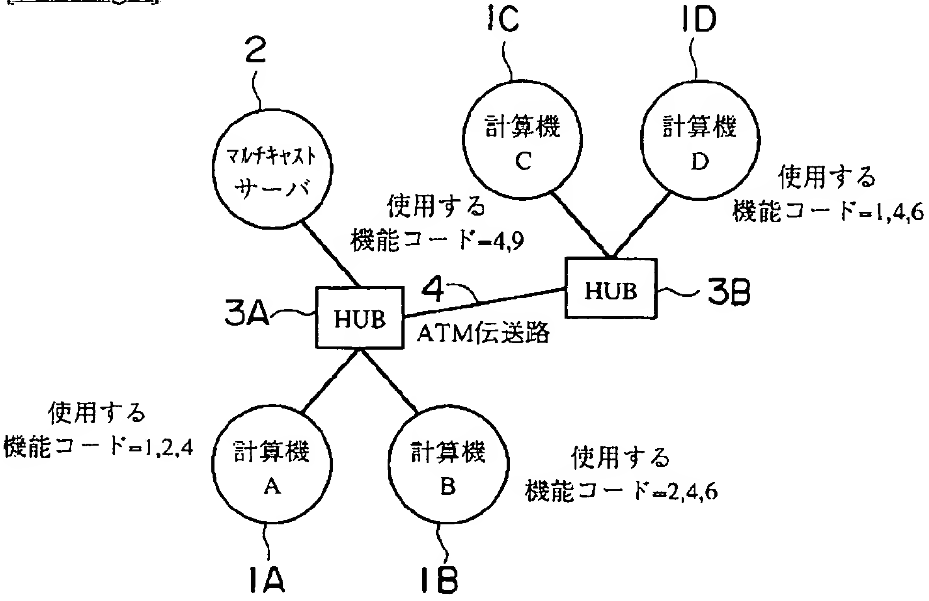
S3
71
72
73
74
B 送出コネクション選択
S4
C 分割セル送出
S5
１セル分受信時間
遅延時間Ｔｄ

[Drawing 1]


2
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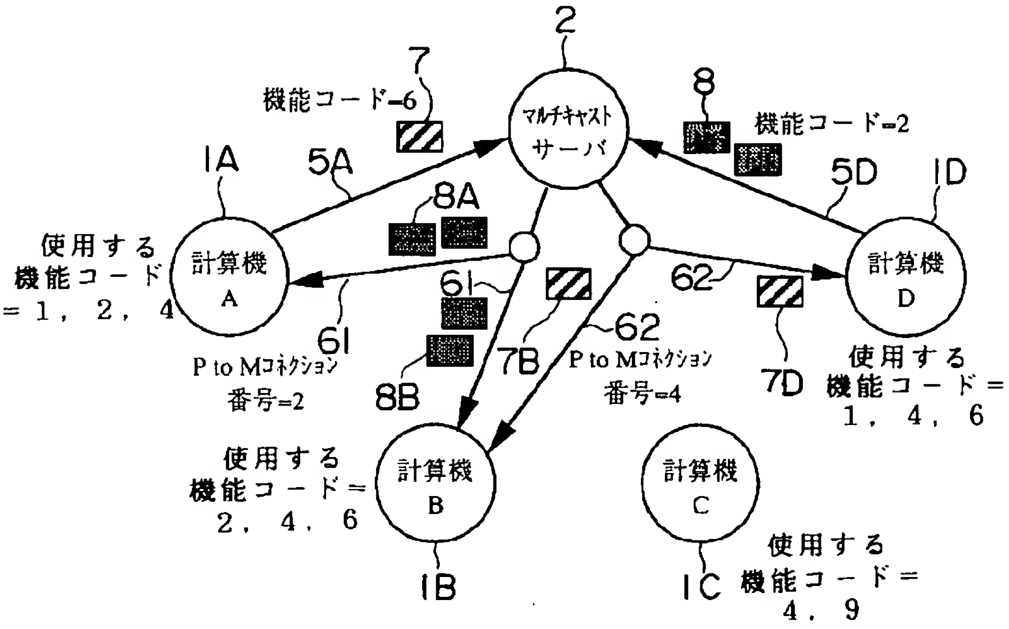
計算機 C
1D
計算機 D
使用する機能コード=1,4,6
使用する機能コード=4,9
4
3A
HUB
HUB
3B
ATM伝送路
使用する機能コード=1,2,4
計算機 A
計算機 B
使用する機能コード=2,4,6
1A
1B

[Drawing 2]


2
マルチキャスト
サーバ
7
機能コード=6
8
機能コード=2
1A
5A
8A
5D
1D
使用する
機能コード
=1，2，4
計算機
A
61
61
P to Mコネクション
番号=2
7B
8B
62
62
P to Mコネクション
番号=4
計算機
D
7D
使用する
機能コード=
1，4，6
使用する
機能コード=
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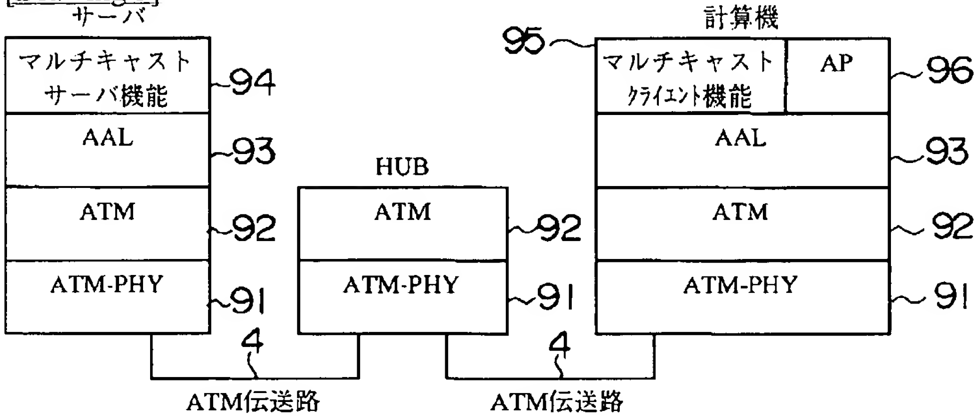
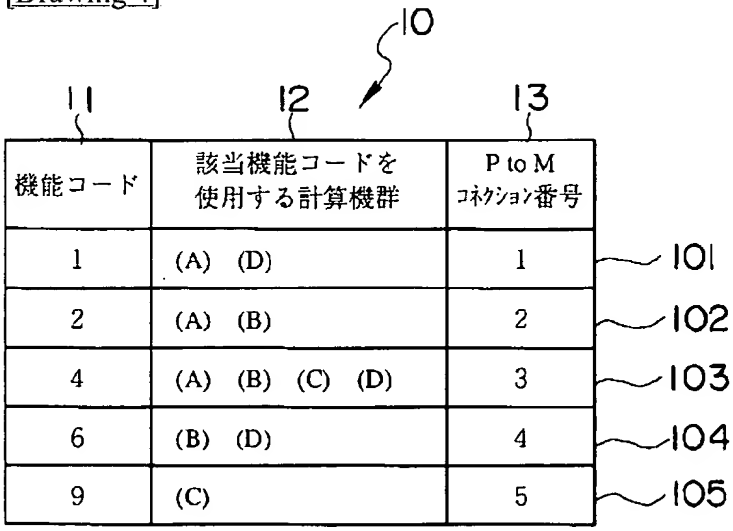
計算機
B
1B
計算機
C
1C
使用する
機能コード=
4，9

[Drawing 3]

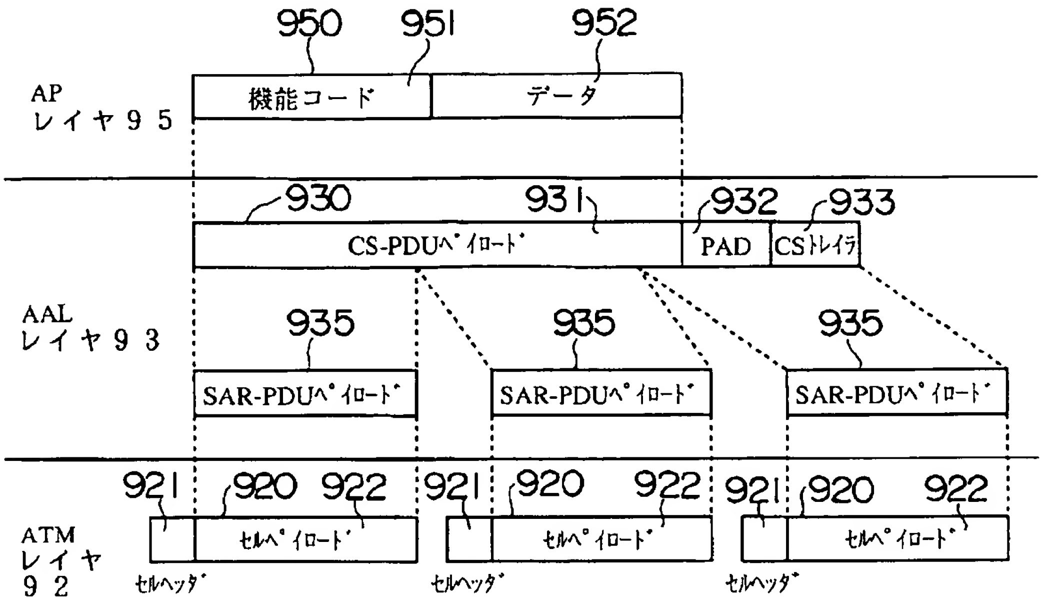

サーバ
マルチキャスト
サーバ機能
94
AAL
93
ATM
92
ATM-PHY
91
HUB
ATM
92
ATM-PHY
91
計算機
95
マルチキャスト
クライエント機能
AP
96
AAL
93
ATM
92
ATM-PHY
91
4
ATM伝送路
4
ATM伝送路

[Drawing 4]

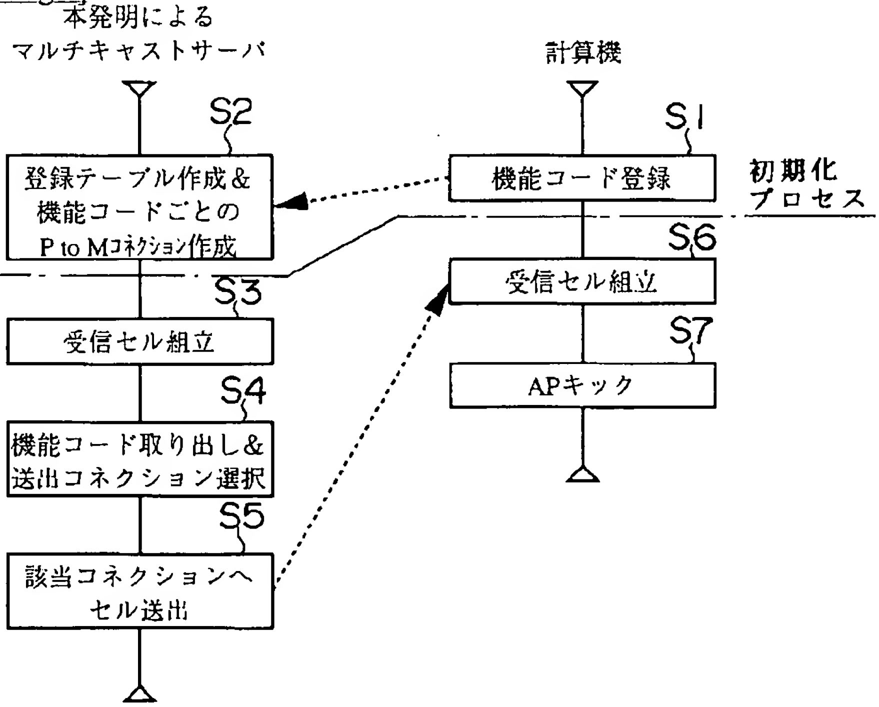

10
11
12
13
101
102
103
104
105

機能コード	該当機能コードを使用する計算機群	P to M コネクション番号
1	(A)　(D)	1
2	(A)　(B)	2
4	(A)　(B)　(C)　(D)	3
6	(B)　(D)	4
9	(C)	5

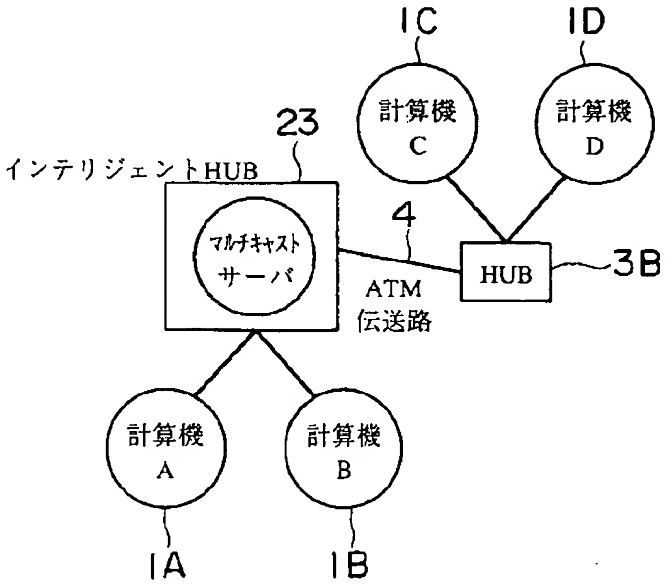
[Drawing 6]


950
951
952
AP
レイヤ95
機能コード
データ
930
931
932
933
CS-PDUペイロード
PAD
CSトレイラ
AAL
レイヤ93
935
SAR-PDUペイロード
921
920
922
ATM
レイヤ
92
セルペイロード
セルヘッダ

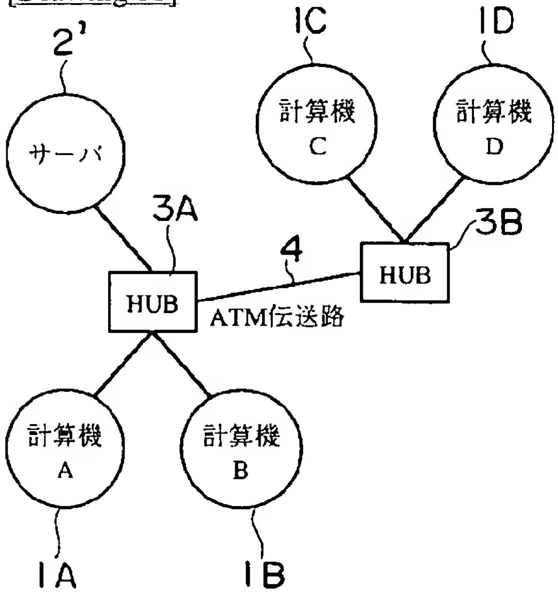
[Drawing 5]


本発明による
マルチキャストサーバ
計算機
S2
登録テーブル作成＆
機能コードごとの
P to Mコネクション作成
S1
機能コード登録
初期化
プロセス
S6
受信セル組立
S7
APキック
S3
受信セル組立
S4
機能コード取り出し＆
送出コネクション選択
S5
該当コネクションへ
セル送出

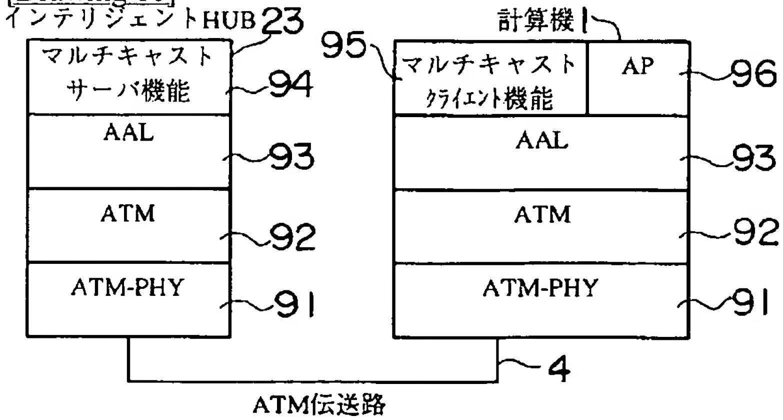
[Drawing 9]


1C
1D
計算機 C
計算機 D
23
インテリジェントHUB
マルチキャストサーバ
4
HUB
3B
ATM 伝送路
計算機 A
計算機 B
1A
1B

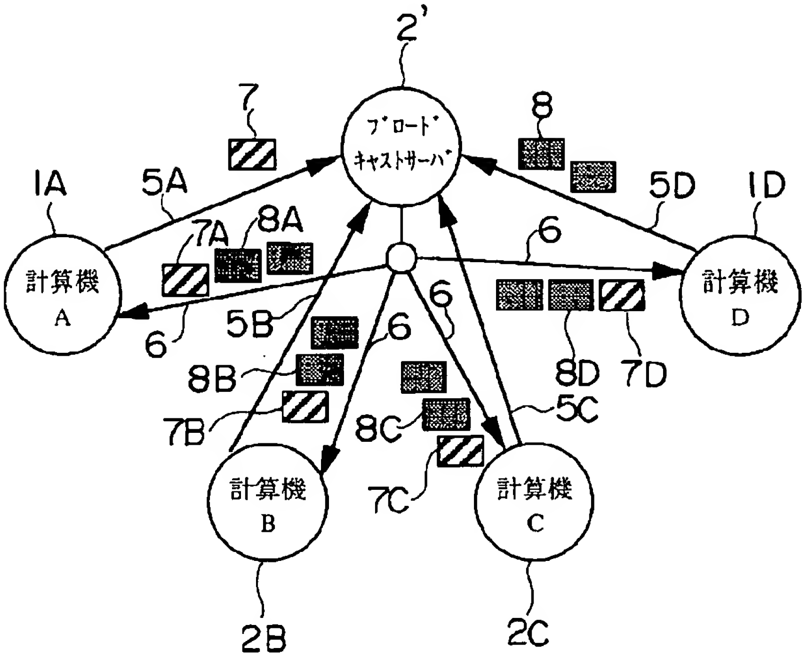
[Drawing 11]


1C
1D
2'
サーバ
計算機 C
計算機 D
3A
3B
4
HUB
HUB
ATM伝送路
計算機 A
計算機 B
1A
1B

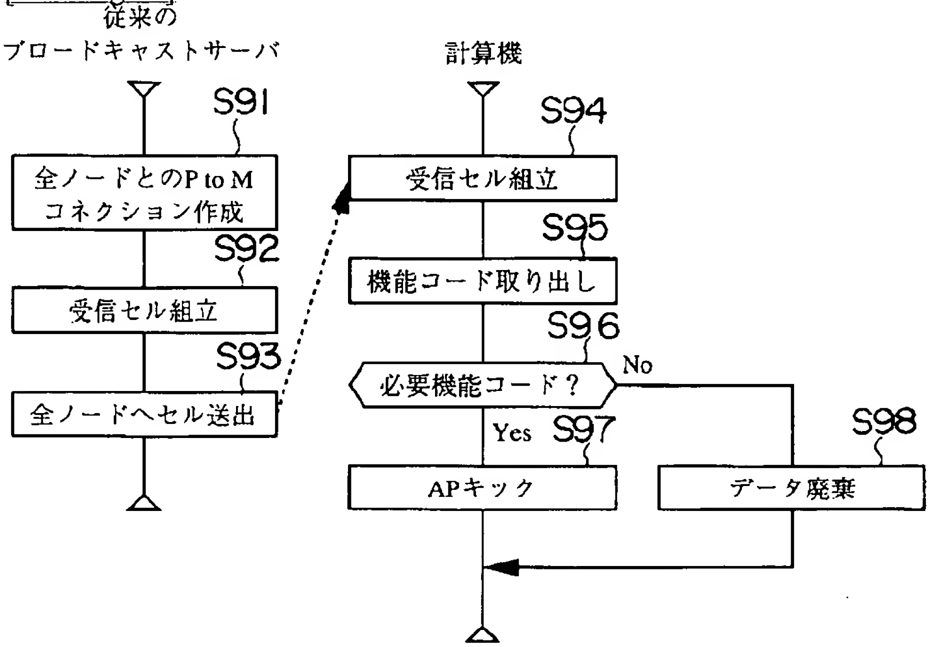
[Drawing 10]


インテリジェントHUB 23
計算機 1
95
マルチキャストサーバ機能
94
マルチキャストクライエント機能
AP
96
AAL
93
AAL
93
ATM
92
ATM
92
ATM-PHY
91
ATM-PHY
91
4
ATM伝送路

[Drawing 12]


2'
ブロードキャストサーバ
7
8
1A
5A
5D
1D
7A
8A
6
計算機 A
計算機 D
5B
6
6
6
8B
7B
8C
5C
8D
7D
7C
計算機 B
計算機 C
2B
2C

[Drawing 13]


従来の
ブロードキャストサーバ
計算機
S91
全ノードとのP to M コネクション作成
S92
受信セル組立
S93
全ノードへセル送出
S94
受信セル組立
S95
機能コード取り出し
S96
必要機能コード？
No
Yes
S97
APキック
S98
データ廃棄

[Translation done.]